



USER MANUAL

Version 1.0 | 10/08/2024
670ZZZD-MAN-EN

DELUXE OIL-FIRED EVAPORATOR



Table des matières

Introduction	3
Information	3
Safety Instructions	4
Product Description	5
Component Identification	5
Performances and specifications	6
Installation.....	9
Evaporator Base Installation.....	9
Evaporator Assembly	9
Prefabricated Chimney	10
Cleaning Before First Use	10
Usage	11
Before Igniting the Evaporator.....	11
Start-Up Steps	11
Operation During Evaporation	12
Adjusting the Draft	12
Evaporator Shutdown Procedure	12
Technical Support	12
Maintenance and Care	13
Cleaning the Pans:.....	13
Storage	14
Troubleshooting	15
Warranty and After-Sales Service	18
Notes.....	20

Introduction

Thank you for choosing the DELUXE oil-fired evaporator from CDL Maple Sugaring Equipment. We are proud to offer you high-quality products designed to meet the demanding needs of the maple syrup industry. This user manual has been created to help you get the most out of your equipment by providing clear and detailed instructions for installation, use, maintenance, and troubleshooting.

At CDL, we are committed to continuously innovating and improving our products to offer you the most efficient and reliable solutions. We encourage you to read this manual carefully and keep it for future reference. If you have any questions or concerns, do not hesitate to contact our technical support team, who will be happy to assist you.

Thank you for trusting CDL for your maple sugaring equipment needs.

Information

Record these details for future reference.

Dimension: _____

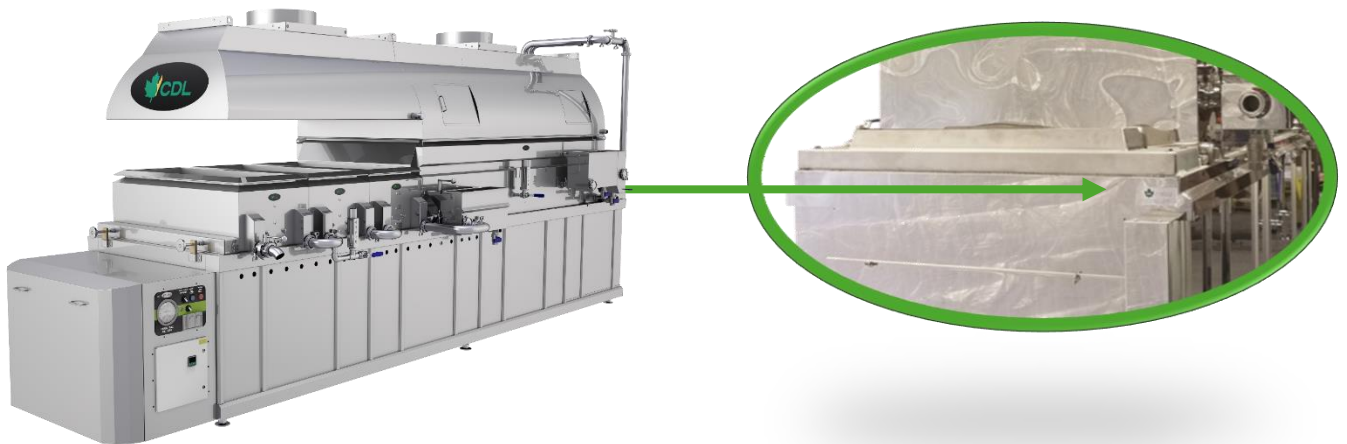
Purchase date and invoice number: _____

Serial number: _____

Sales representative: _____

Serial number location

The serial number is located on the back of the evaporator.



Safety Instructions

Safety is a top priority when installing and using your equipment. This section provides essential information to ensure safe operation. The following symbols are used in this manual to alert you to specific hazards and precautions.



General Hazard: This symbol indicates a potential risk of serious injury or property damage. Please take all necessary precautions to avoid accidents.



Electrical Hazard: This symbol warns of a risk of electric shock, which can result in serious injury or death. Make sure to turn off the power supply before any intervention and follow electrical safety guidelines.



Crush Hazard: This symbol indicates a potential crushing danger that could result in serious injury. Be cautious in areas where moving or heavy parts may shift.



Burn Hazard: This symbol warns of a potential burn risk that could lead to serious injury. Pay attention to hot surfaces and high-temperature liquids. Use protective equipment to prevent burns.

An oil-fired evaporator is a powerful piece of equipment that can pose serious dangers if the instructions in this guide are not followed. It is essential to wear heat-resistant gloves and clothing when using the evaporator. Additionally, visitors should be informed of potential risks and should stay at a safe distance from the equipment at all times.

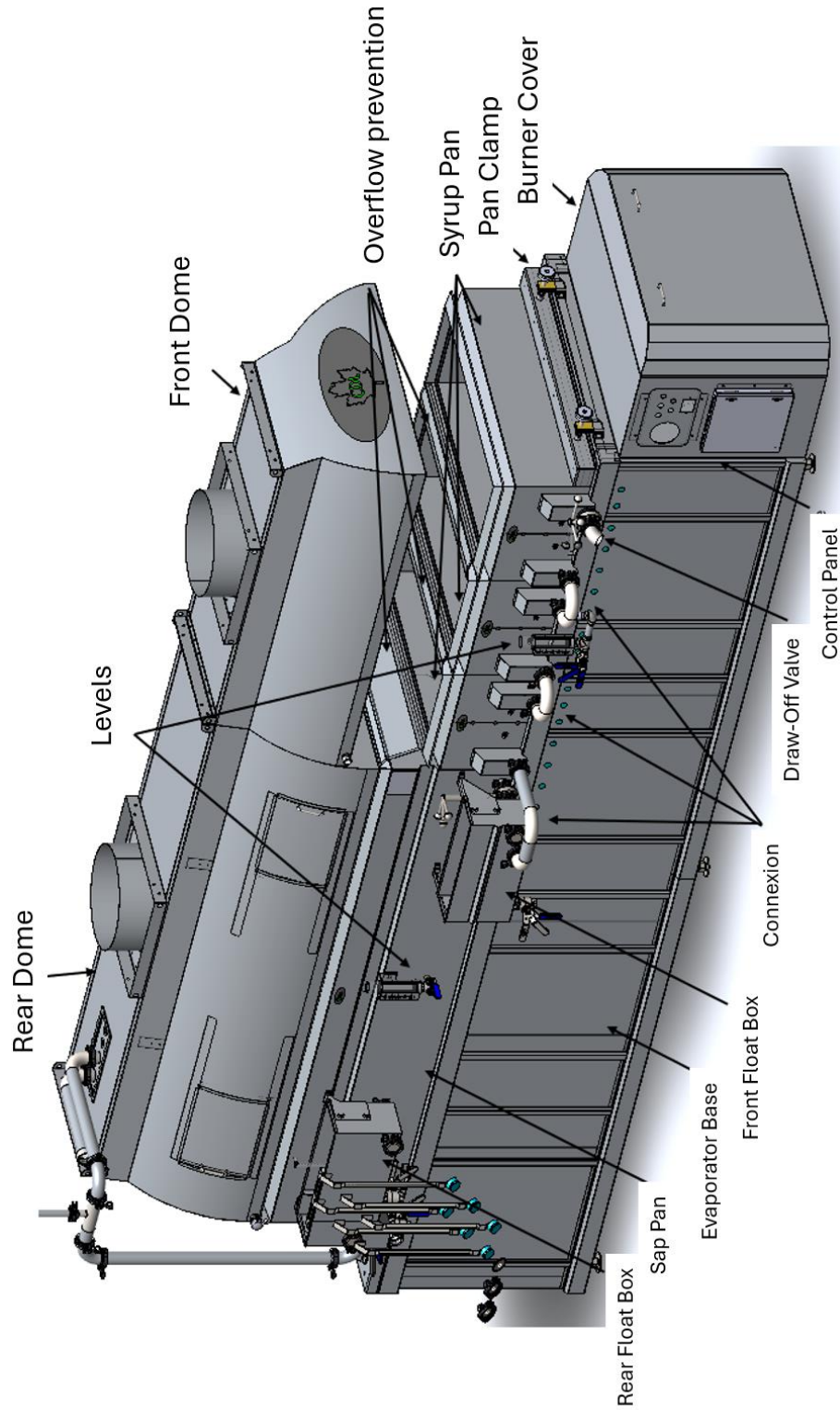
The oil-fired evaporator operates with liquid fuel and generates intense heat, which can cause severe burns. Metal surfaces, such as the pans and smoke or steam stacks, can reach temperatures high enough to cause immediate burns. Boiling syrup splashes or steam returns are also risks that should be closely monitored.

The evaporator must be installed on a fire-resistant surface capable of supporting the weight of the equipment and its contents. It is recommended to maintain a minimum distance of 24 inches (60 cm) around the evaporator. If a closer installation to a wall is necessary, a heat-resistant covering should be applied to the wall. Ensure that the chimneys are not obstructed by roof trusses and that a properly sized flashing is installed for each chimney passing through the roof. Additionally, it is recommended that the sugar shack ceiling be high enough to allow the safe lifting of domes (if applicable) using a system of cables and pulleys.

IMPORTANT: It is strongly recommended to contact your insurance company to ensure that your installation complies with all safety requirements, as these can vary between companies.

Product Description

Component Identification

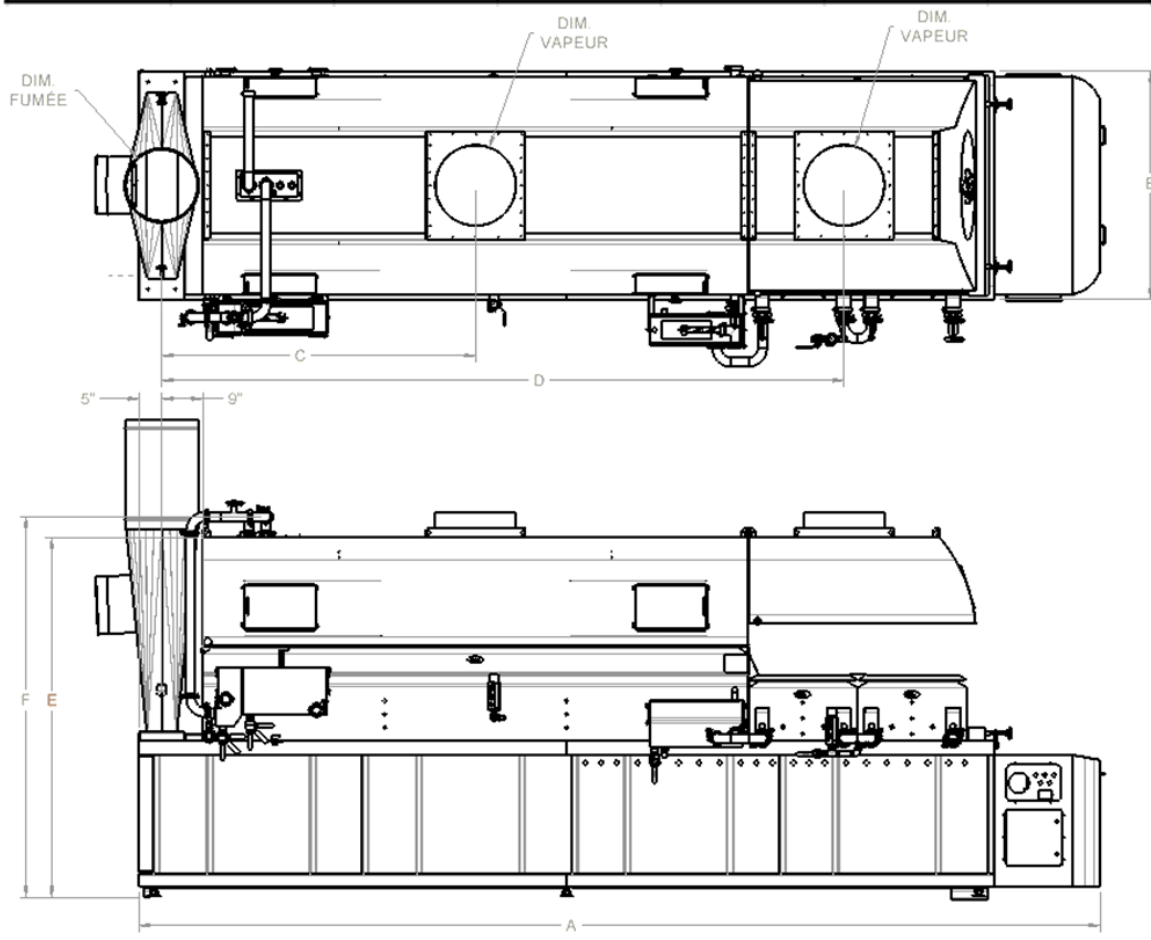


Performances and specifications

Deluxe Oil-fired Evaporator		
Dimension	Evaporation IMP GPH	Evaporation US GPH
2 X 6	36	40.8
2 X 8	48	54.5
2.5 X 8	60	68
2.5 X 10	75	85
3 X 10	90	102
3 X 12	108	112.5
3.5 X 12	126	143
3.5 X 13	137	155
4 X 12	144	163
4 X 13	156	177
4 X 14	168	190.5
4 X 15	180	204
5 X 16	240	272
6 X 16	288	326.5

Sap Capacity in Rear Flue Pan			
Dimension	Flue Height (inch)	At Flue Level IMP GAL.	For each inch over Flue IMP GAL.
2 X 4	7	15	4.15
2 X 5	7	18.5	5.15
2.5 X 5	7	21	6.4
2.5 X 7	7	29	9
3 X 7	7	34.2	11
3 X 8	7	38	12.5
3.5 X 8	7	44.5	14.5
4 X 8	7	50.5	16.65
4 X 10	7	62.25	20.75
5 X 10	7	74.5	25.75
6 X 10	7	89	31

Oil-Fired Evaporator						
Model	Dimension (Inches)					
	A	B	C	D	E	F
2 X 6	119 1/4	28 1/4	36	69	74	70 1/2
2 X 8	143 1/4	28 1/4	39	87	74	70 1/2
2.5 X 8	143 1/4	33 3/4	39	87	77 1/4	74 1/2
2.5 X 10	167 1/4	33 3/4	51	111	77 1/4	74 1/2
3 X 10	167 1/4	40 1/4	51	111	79	82 1/2
3 X 12	191 1/4	40 1/4	57	129	79	82 1/2
3.5 X 12	191 1/4	44 1/4	57	129	79	82 1/2
3.5 X 13	203 1/4	44 1/4	57	135	79	82 1/2
4 X 12	191 1/4	50 1/4	57	129	79	82 1/2
4 X 13	203 1/4	50 1/4	57	136	79	82 1/2
4 X 14	215 1/4	50 1/4	69	153	79	82 1/2
4 X 15	227 1/4	50 1/4	69	159	79	82 1/2
5 X 16	243 1/4	61 3/4	71 1/4	167 1/4	79	82 1/2
6 X 16	223 1/4	61 3/4	71 1/4	167 1/4	79	82 1/2



General Information					
Evaporator Size	Smoke Stack Diameter	Wire Size	Amp.	Burner	Oil line Diameter
2 X 6	10	6/2 BX	50	Beckett CF-500	3/8
2 X 8	10	6/2 BX	50	Beckett CF-800	3/8
2.5 X 8	10	6/2 BX	50	Carlin 601	3/8
2.5 X 10	10	6/2 BX	50	Carlin 601	3/8
3 X 10	12	8/3 BX	40	Carlin 701	3/8
3 X 12	14	8/3 BX	40	Carlin 701	3/8
3.5 X 12	16	8/3 BX	40	Carlin 701	1/2
3.5 X 13	16	8/3 BX	40	Carlin 701	1/2
4 X 12	16	8/3 BX	40	Carlin 801	1/2
4 X 13	16	8/3 BX	40	Carlin 801	1/2
4 X 14	16	8/3 BX	40	Carlin 801	1/2
4 X 15	16	8/3 BX	40	Carlin 801	1/2
5 X 16	18	6/3 BX	50	Carlin 801 (2)	1/2
6 X 16	22	6/3 BX	50	Carlin 801 (2)	1/2

Burner Information						
Model	Volts	HP	Amps.	GPH	Oil Feed	Oil Return
Beckett CF-500	110 volts	1/3	4.8	1.75/5.5	3/8	NO
Beckett CF-800	110 volts	1/3	4.8	3/8	3/8	NO
Carlin 601	110 volts	1/2	8.4	6/13.2	3/8 (1 Burner) 1/2 (2 Burners)	NO
Carlin 701	110/220 volts	1/2	8.4/4.2	6/13.2	1/2 (1 or 2 Burners)	3/4
Carlin 801	110/220 volts	3/4	9.8/4.9	11.4/19.8	1/2 (1 Burner) 3/4 (2 Burners)	3/4

Installation

Evaporator Base Installation

1. **Positioning:** Place the evaporator in the designated location, remove the transport wheels, and insert the adjustable legs into the designated slots.
2. **Removing the pans and accessories:** Remove all pans and accessories from the base of the evaporator.
3. **Leveling the evaporator:** Using a level, adjust the legs to ensure the top of the base is perfectly level, both in width and length.
4. **Connecting the oil tank:** Connect the oil tank to the burner, following CDL's instructions and complying with local regulations applicable to this type of installation.
5. **Fuel type:** Only #1 or #2 oil is authorized as fuel.
6. **Electrical connection:** The control panel connection must be done by a certified electrician. (Note: The controls must be powered according to the electrical plan located in the main control panel).
7. **Building ventilation:** If your building is not insulated, it will support good combustion and better steam evacuation. If the building is insulated, ensure there are sufficient air intakes to improve combustion and chimney draw.

Evaporator Assembly

1. **Installing the pans:** Start by installing the rear spacer block, followed by the rear flue pan (the largest one), and then the syrup pans at the front. Ensure that the pans are tightly secured together using the pan clamp located at the front of the evaporator.
2. **Installing the flashings:** Attach the flashings to the roof, aligning them carefully with the evaporator outlets. Ensure that the joints are sealed properly to prevent leaks. (Tip: Check with your insurance company for the required clearance for the smoke chimney, as different companies may have different requirements).
3. **Installing the smoke chimney:** Using rivets or self-tapping screws, install the smoke chimney sections provided, starting from the base. Secure all the pipes included with the evaporator. The height of the chimney should be at least 1.5 times the length of the evaporator, and the pipes must extend at least 2 feet above the roof ridge.
4. **Installing the steam stacks (if applicable):** Follow the same procedure to install the steam stacks.
5. **Securing collars and caps:** Install the collars, then place the Chinese caps and/or hinged covers outside the building. For hinged caps, pass a cable inside the building to allow opening and closing. (Note: Hinged caps should be oriented so that prevailing winds naturally close the cap).

6. **Securing steel cables:** Attach steel cables to the pipes to keep them in place. Be careful not to overtighten the cables, as the chimney expands with heat.
7. **Removing the protective film:** Remove the plastic protective film from the stainless steel parts of the evaporator. (Note: This film can be difficult to remove in cold weather).
8. **Installing the float boxes and connections:** Install the float boxes, connections, and water level(s). Connect the evaporator's water inlet to your reservoir. The lowest point of the reservoir should be at least 12 inches above the maximum water level of the evaporator. Use Teflon tape on all threads to prevent leaks.
9. **Start-up by a CDL technician:** A start-up by a CDL technician is included with the purchase of a new oil-fired evaporator. To schedule this service, contact your CDL representative. A technician will come to your sugar shack to make the necessary adjustments and ensure the equipment is working properly. Before the technician arrives, make sure the oil tank is connected and filled, the electricity is connected to the sugar shack and the evaporator, and you have enough water for the tests (regular water can be used for the start-up).

Prefabricated Chimney

If you choose to purchase a prefabricated chimney to be used with your evaporator, please follow the manufacturer's instructions. The temperature inside the smoke chimney can reach up to 1000°F. Before proceeding with the installation, ensure that the chimney is designed to withstand these conditions. Also, check with your insurance company to make sure it meets their safety standards.

Cleaning Before First Use

Before the first use, prepare a solution of warm soapy water, adding one cup of vinegar (250 ml) or 15 ml (1/2 oz) of acetic acid per gallon (4L) of solution.

Manually clean all stainless steel components that may come into contact with maple sap or syrup, such as pipes, fittings, and valves. Rinse thoroughly and dry with a soft, clean cloth. This step helps remove any residual manufacturing oils, polishing paste, or packaging debris.

Usage

Before Igniting the Evaporator

- Open the maple sap inlet to the evaporator.
- Open the oil valve leading to the burner.
- Power on the burner(s) (ensure that the main electrical supply is activated).
- Open the caps of the steam and smoke chimneys.
- Check that the pan outlets are not obstructed.
- Make sure the oil tank is sufficiently filled.
- Verify that the oil line is neither frozen nor blocked.
- Ensure that the oil filter is clean.

Start-Up Steps

1. Open the hinged cap of the smoke chimney.
2. Ensure all water inlet valves are working properly and that the pan outlets are not blocked.
3. It is recommended to install a thermometer on each syrup pan. Calibrate them by placing them in boiling water, then adjust them to 0 degrees.
4. Open the valve of the maple sap reservoir leading to the water pan and fill it until the level reaches 1 inch above the flues.
5. Open the valve of the front float box and fill the syrup pans until the depth reaches at least 2 inches.
6. Using a measuring tape, compare the actual water level reading with the scale on the water levels and adjust as needed. (Note: In the back pan, the "0" level corresponds to the top of the flues).
7. Start the evaporator on LOW FIRE (for evaporators 3 feet wide and larger only). Allow the system to stabilize and ensure you are comfortable with its operation before switching to HIGH FIRE.
8. To check if the evaporator is level, measure the distance from the bottom of the pans to the water level at each corner. If the evaporator is level, the measurements should be the same at all corners.
9. Once the evaporator is running, use the float boxes to stabilize the water levels. We recommend a water level of 1 inch above the flues for the water pan and between 1 ½ inches and 2 inches in the syrup pans.
10. Make sure the valve of the sap reservoir remains open at all times. If the valve is closed, you risk burning the water pan.

Operation During Evaporation

1. **Use of Defoamer:** Adding defoamer is essential to ensure the proper functioning of the evaporator. Excessive foam production can disrupt the operation of the float boxes, causing instability in water levels and a risk of running out of water. Additionally, defoamer helps prevent unpleasant syrup overflows.
2. **Monitoring Water Levels:** Pay close attention to the water levels in both the front and rear pans, and adjust them as needed using the cranks on each float.
3. **Syrup Cooking Point:** Maple syrup is ready when it reaches 7 degrees above the boiling point of water. Open the valve when the syrup reaches this temperature, and close it when the temperature drops below 7 degrees.
4. **Repeating the Draw-Off:** Repeat the draw-off each time the syrup reaches 7 degrees above the boiling point. It is normal for the draw-off temperature to vary throughout a boiling day due to changes in atmospheric pressure. Be attentive and regularly calibrate your syrup using a hydrotherm, hydrometer, or refractometer, which are available at your local CDL store.
5. **Adjusting Water Levels:** With more experience, you can lower the water levels in the pans. The ideal level in the water pan is 1 inch above the flues, and between 1 ½ inches and 2 inches in the syrup pans. A lower water level allows for faster boiling, but be careful not to lower it too much, as this increases the risk of burning the pans.

Adjusting the Draft

The draft on an oil-fired evaporator is adjusted by turning the key located at the base of the stack. To increase the draft, open the key further. Make sure you have at least 2 feet of pipe above the roof peak and a minimum of 1.5 times the length of the evaporator in chimney height. If the draft remains insufficient, add an extra section of pipe.

Evaporator Shutdown Procedure

1. Turn the burner power switch to the off position.
2. Close the valve located between the float box and the water pan.
3. Every evening, it is recommended to replace the stagnant sap in both the front and rear float boxes, as well as in the water level gauge.

Technical Support

If you encounter any issues, do not hesitate to contact one of our technicians at 1-800-883-5158 or reach out to your CDL representative.

Maintenance and Care

Cleaning the Pans:

1. Completely fill the pans with filtrate or clean water.
2. Add the CDL-recommended pan cleaner (refer to the label for the correct amount). Heat the water to about 90°C (194°F), then turn off the heat and let it sit overnight.
3. Drain the pans and rinse them thoroughly with water to remove any remaining cleaner residue.
4. Refill the pans, then add baking soda to neutralize any remaining cleaner. Let it sit for 15 minutes, then drain and rinse one last time.
5. Never use abrasive products, wire brushes, steel wool, or products containing chlorine or muriatic acid.
6. If syrup has burned on the outside of the pans, you can use a commercial oven cleaner (on a cold oven). Ensure there is no syrup left in the pans before proceeding. This cleaner will dissolve the syrup without damaging the pans. To restore the shine, use an industrial foaming glass cleaner.

IMPORTANT: Between seasons, any traces of acid left in the pans could damage them at the beginning of the next season.

When to Clean the Pans

The frequency of cleaning the pans depends on the time of the season and the amount of deposits (sugar sand) that form at the bottom of the pans.

- **Syrup pans:** Check them every hour. As soon as too many deposits accumulate at the bottom, replace the pan with a clean one or proceed with cleaning.
- **Water pan:** The cleaning frequency depends on the size of the evaporator and the amount of sugar sand in the sap. In general, one cleaning mid-season is sufficient. However, if too much sugar sand accumulates in the water pan, it can cause burns or cracks at the bottom of the flues. The water pan should be inspected daily.

Storage

1. Lift the pans and place a block between the frame and the pans to allow air circulation around them. Excessive humidity could damage the pans.
2. Ensure the pans are thoroughly cleaned. Remove all sugar sand using an appropriate cleaner. If necessary, scrub the flues inside and outside of the water pan with suitable brushes and use a pressure washer.
3. Never leave cleaning products in the pans. This could lead to rapid damage, which would not be covered by the warranty.
4. The gaskets should be greased with food-grade grease to prevent them from drying out.

Troubleshooting

This troubleshooting section is designed to help you quickly identify and resolve issues you may encounter with your equipment. Should any issues persist, your CDL representative or our customer service team is available to provide further assistance.

Problems and Solutions

1. Ignition Problems:

- **Excess air (HI FIRE damper is open)**
Cause: The air damper remains open, preventing ignition.
Solution: The air damper should be in a closed position (or almost closed, depending on the settings). If, after several attempts, ignition fails, throw a lit piece of paper under the pans to burn off the excess oil in the evaporator.
- **No oil reaching the equipment**
Cause: Oil is not reaching the equipment.
Solution: Purge the pump using the purge port and a 5/16 hose.
- **Primary controller malfunction**
Cause: The primary controller is in error (red light).
Solution: Press the red button to reset. If this fails after several tries, hold the button for 30 seconds to restart.
- **Faulty 4-second relay**
Cause: The relay is not allowing oil injection after the spark.
Solution: Test the relay to ensure it is functioning properly.
- **No electrical arc at the burner electrodes**
Causes: The flame sensor is defective, the ignition transformer is faulty, or the electrodes are misaligned or broken.
Solution: Check and adjust the electrode spacing. Replace faulty components as necessary.

2. PROTECT-O System Issues:

- **Wiring problem**
Cause: Incorrect connection of electrical wires.
Solution: Check the connectors on the side of the evaporator and ensure the wires are connected to pin #2 of the connector.
- **Conductivity problem**
Cause: Filtrate does not conduct electricity, preventing the start.
Solution: Try starting in filtrate or install the probes directly onto the pans. You can also add salt to the levels to improve conductivity.

3. Burner-Related Issues:

- **The burner sends oil but does not ignite**
Causes: The ignition transformer, 30-second relay, or solenoid may be defective. The air trap may be open.
Solution: Check and replace defective parts. Close the air trap if it is open.
- **Oil leaking from the air trap**
Cause: The O-ring on the oil pump is defective.
Solution: Replace the O-ring.
- **Air present in the oil**
Causes: A leak in the oil line or the oil tank is empty.
Solution: Repair the leaks in the line and ensure the oil tank is full.

4. Combustion and Pressure Problems:

- **Black smoke, blurred flame, and blackened pan bottoms**
Cause: Lack of air in the evaporator.
Solutions: Check if the burner dampers are stuck. Open a window or door to improve ventilation. Check the oil pressure:
 - Carlin: 150 PSI
 - Beckett: 150 PSI (LOW) / 300 PSI (HIGH)
You can adjust the HI FIRE damper by turning the bolt a quarter turn to increase the opening.
- **Evaporator operating under positive pressure**
Cause: The evaporator frame is hot.
Solution: Ensure that the smoke chimney cap is open. Check the manometer (Magnehelic), which should indicate a pressure between 0.03 and 0.05. Adjust it with the base key.

5. Steam Problems Inside the Building:

- **Lack of air intake in the building**
Cause: Steam buildup inside the building.
Solution: Open a window or door to improve air circulation.
- **Dome chimney damper too closed**
Cause: Incorrect adjustment of the dome chimney damper (preheater in the dome).
Solution: Adjust the damper until no steam escapes from the dome doors, while maintaining slight positive pressure in the dome for optimal preheater performance.

6. Water Level and Syrup Production Issues:

- **Unstable water levels in the pans**
Causes: The rubber washer in the float arm is worn or misaligned. The float arm needs to be realigned, or there is a hole in the float, allowing liquid to enter.
Solution: Replace or realign the damaged components.

- **Syrup produced in the first syrup pan**
Cause: This can be normal at the beginning of the process.
Solutions: Draw off syrup and redistribute it in the water pan to promote movement. If the problem persists, reduce the draft to lower the heat in the first syrup pan.

7. Additional Mechanical Issues:

- **Excessive stack vibration (flame divided at the burner)**
Cause: Burner adjustment issue.
Solution: Temporarily set the burner to LOW FIRE and contact CDL for adjustment.
- **Pans overheating**
Causes: The burner angle is incorrect, or the burner nozzles are defective.
Solution: Check and adjust the burner angle. Replace the nozzles if necessary.
- **Maple sap boiling too intensely at the front or rear**
Cause: Draft issue.
Solution: Adjust the draft by modifying the key located at the rear of the evaporator.

8. Evaporator Start-Up Problems:

- **Evaporator does not start**

Causes:

- The oil inlet valve is closed.
- The oil tank is empty.
- The burner is not receiving power.
- The burner relay is malfunctioning.
- The oil line is poorly configured or frozen.
- There is an air bubble in the oil line.

Solutions:

- Open the oil valve.
- Ensure the oil tank is full.
- Check the electrical power supply.
- Purge the oil pump.
- Use a heat source to warm the incoming air at the beginning of the season.
- If you are using a DETECT-O, add salt to the water to improve conductivity.

If the problem persists, contact CDL technical support at 1-800-883-5158 or your CDL representative.



Warranty and After-Sales Service

Your evaporator is covered by a limited two-year warranty. For two years from the date of original purchase, Les Équipements d'Érablière CDL Inc. will repair or replace parts of this evaporator that are found to be defective in material or workmanship, provided that the evaporator is installed, used, and maintained according to the instructions provided.

Exclusions

This warranty **does not** cover the following:

1. Products where the serial number has been removed, altered, or is not easily readable.
2. Evaporators that have changed ownership or are located outside of North America.
3. Production losses due to any problems with the evaporator.
4. Loss of income caused by the quality of the syrup.
5. Service calls not related to a malfunction, manufacturing defect, or material defect, or for products not used according to the provided instructions.
6. Service calls to verify the installation of your evaporator or to receive operating instructions.
7. Expenses incurred to make the appliance accessible for repair and travel costs.
8. Service calls to repair evaporator insulation.
9. Service calls after two years.
10. Damage caused by repairs performed by unauthorized technicians; use of parts other than original CDL parts or parts not obtained through an authorized technician; or external causes such as abuse, misuse, accidents, fires, or natural disasters.
11. Consumable products (oil) and accessories.
12. If the evaporator has been damaged due to misuse, neglect, customer modifications, or electrical issues.
13. Damage caused by the use of products not intended for use in an evaporator, misuse of acid or cleaning products.
14. Use of recycled, contaminated, or substandard oil.
15. Use of any fuel other than #1 or #2 oil.

Disclaimer of Implied Warranties; Limitation of Remedies

The customer's sole remedy under this limited warranty is the repair or replacement of the product as described above. Claims based on warranties, including warranties of merchantability or fitness for a particular purpose, are limited to two years or the shortest period allowed by law, which shall not be less than two years. Les Équipements d'érablière CDL Inc. shall not be liable for incidental or consequential damages, nor for material and implied damages. Some states and provinces do not allow limitations or exclusions on incidental or consequential damages or limitations on warranties. In such cases, these limitations or exclusions may not apply to you. This written warranty gives you specific legal rights. Depending on your state or province, you may have other rights.

If You Require Service

Keep your receipt, delivery slip, or any other valid proof of payment to establish the warranty period in case you need to request service. If a repair is made, it is in your best interest to obtain and keep all receipts. Warranty service must be obtained by contacting CDL at the addresses or phone numbers below.

Service for your evaporator will be performed by CDL in Canada. The features and specifications described or illustrated may be subject to change without notice.

Les Équipements d'érablière CDL Inc.
257, route 279
Saint-Lazare-de-Bellechasse
Québec, Canada G0R 3J0
1-800 883-5158 | cdlinc.ca

Notes

